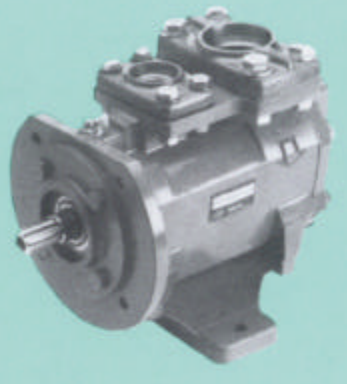
3-44 GPM Up to 150 PSI

Imo™ Pump



Model ACE

IMO Model ACE pumps are positive displacement, rotary, screw-type pumps designed and engineered for excellent suction capability over a wide range of fluid viscosities. Flow rates (3 to 44 GPM) are proportional to rotating speed when the pump is operated within the recommended pressure range (up to 150 PSI). The self-priming design permits both evacuation of air filled inlet lines and repriming if suction is lost.

The unique IMO design – only three moving parts – is the key to the Model ACE pump performance. A precision bored housing encases the driven screw (power rotor) and intermeshing sealing screws (idler rotors). The accurately machined idler rotors conform perfectly to the threads of the power rotor and to the housing bores, confining the fluid in a succession of closures or cavities. As the screws rotate, the fluid is moved axially from the inlet port to the outlet port in a continuous, uniform flow. This uniform axial flow results in a minimum of fluid pulsation and extremely quiet operation.

The rotating idler rotors generate a hydrodynamic film of fluid which supports the idlers in the housing bores and prohibits wearing contact. The strength of this film is based on fluid viscosity, pump pressure and speed. As pressure requirements increase, the hydrodynamic film can be strengthened by increasing viscosity or speed. Both the flow rate and pressure capability of the IMO pump increase with speed; thus higher speeds generally result in better performance and longer life.

The Model ACE is lubricated by the pumped fluid and is designed so that all axial and radial loads on the rotor set are supported by a system of thrust and journal bearings. This IMO design feature extends pump life and assures the quiet and trouble free operation for which IMO pumps are known.

The simple, compact design of the Model ACE pump permits fast, easy installation, low maintenance, and ease of repair. Periodic inspections can be made without removing the pump, and routine maintenance can be performed without disturbing system piping.

The Model ACE is available as either a face or foot mounted unit in five basic flow steps. Two different casing materials and mechanical seals are offered. Model ACE is available with an integral relief valve as either a bare pump or complete pump/driver assembly.

Applications

Model ACE pumps are designed to meet the requirements for hydraulic, lubricating and distillate fuel oil applications. These units have been widely utilized in power plants, refineries, fuel oil burners, petrochemical plants, mechanical transmissions, and lubricating oil systems – wherever high performance and reliability in a compact design are required.

Typical applications are:

Lubrication of diesel engines, steam turbine/generator sets, reciprocating and centrifugal compressors, transmission gears, large centrifugal pumps, high inlet pressure refrigeration screw compressors, and other rotating machinery.

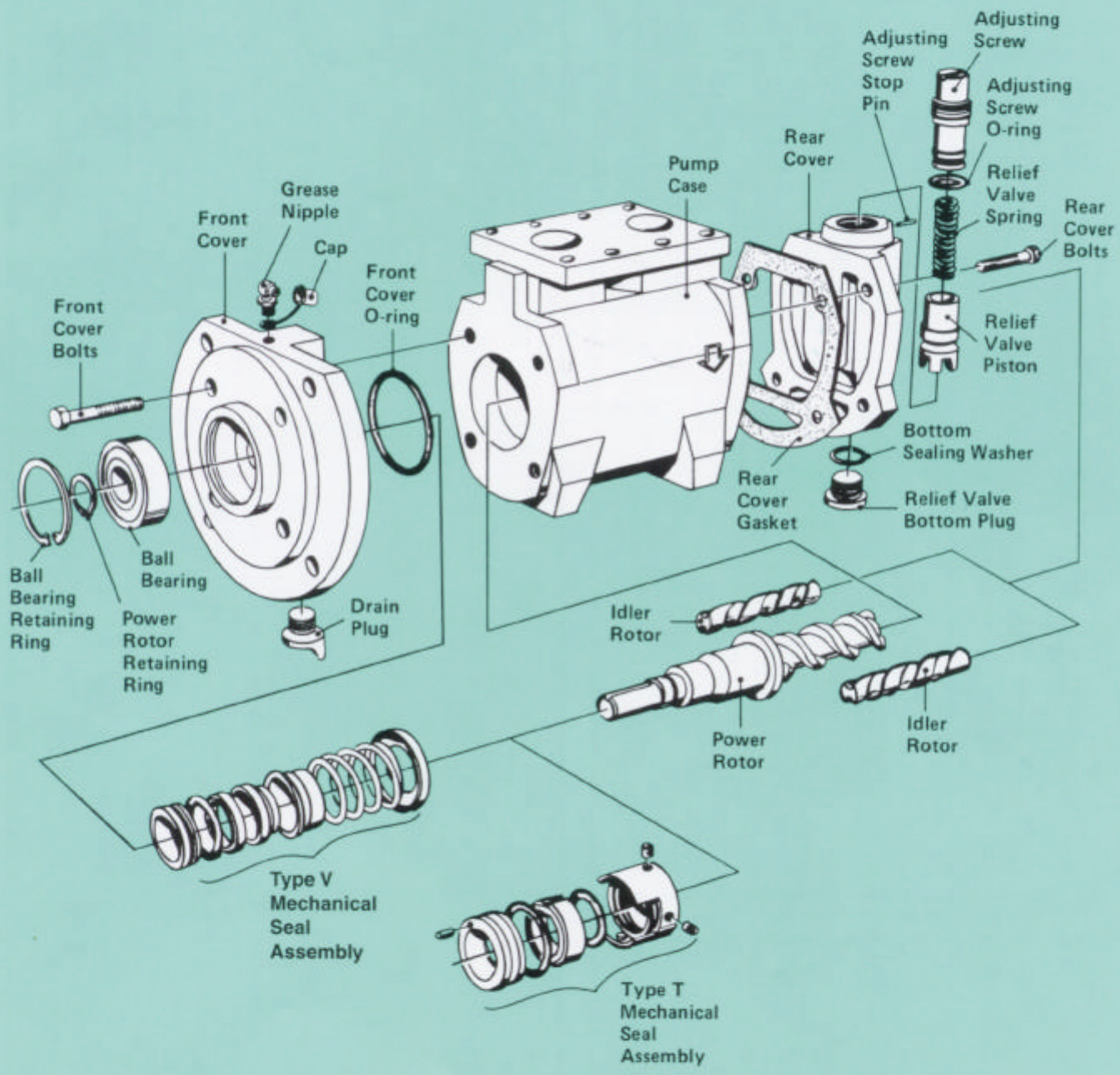
Circulation of fuel oils, hydraulic oils, transformer insulating oil and most petroleum based fluids in general.

Transfer, Loading and Unloading of clean lube, fuel, waste and similar type oils in refineries, factories, storage or settling tanks and lube oil reservoirs.

Specifications and Features

CASING	Pearlitic or nodular cast iron.	
POWER ROTOR	Carbon (mild) steel, sulfinized treated for increased rotor life.	
IDLER ROTORS	Pearlitic cast iron, sulfinized treated for increased rotor life.	
PUMP INTERNALS	Casing I:	Pearlitic cast iron with regreasable ball bearing and Type V mechanical seal as standard. Recommended for general lube oils.
	Casing N:	Nodular cast iron, sulfinized treated for rotor bore surface hardness with regreasable ball bearing and Type T mechanical seal as standard. Recommended for all fuel oils.
MECHANICAL SEAL	Type V:	Viton elastomers with carbon on ni-resist seal faces, and stainless steel spring. Standard with Type I casting.
	Type T:	Viton elastomers with tungsten carbide seal faces and stainless steel spring. Standard with Type N casing.
OPERATING PRESSURE	150 PSI maximum as standard. Up to 225 PSI under approved conditions. Consult IMO.	
INLET PRESSURE	100 PSIG maximum as standard. Up to 250 PSIG inlet and 350 PSIG discharge capability available. Consult IMO.	
VISCOSITY	2.0 cst — 1500 cst (7000 SSU) as standard. Up to 5000 cst (15,000 SSU) on approved conditions. Consult Performance Data tables for Net Inlet Pressure Requirements (NIPR) and minimum allowable operating viscosity at specific speeds and pressures.	
TEMPERATURE	0 - 190°F for pearlitic cast iron casing with Type V mechanical seal. 0 - 310°F for nodular cast iron casing with Type T mechanical seal.	
DRIVE	Direct drive only.	
ROTATION	Clockwise as viewed facing pump shaft as standard. Counterclockwise available as an option.	
MOUNTING	May be foot or flange mounted in any attitude.	
CONNECTIONS	Inlet and outlet may be furnished with NPT or socket weld adaptor flanges.	
FILTRATION	Inlet strainers are required to keep contaminants and abrasives out of pump, but they must be selected with consultation with strainer vendor to prevent pump starvation. Normally, 60 mesh for light oils and 1/8"–3/16" openings for heavy oils are recommended.	
RELIEF VALVES	Integral relief valves with internal return are provided as standard. Pumps are available without relief valves.	
ACCESSORIES	Adapters for NEMA "C" face motors and completely mounted pump/driver assemblies on steel bedplates.	

Typical ACE Assembly



(For Models with Relief Valve)

Performance Data

Rotor Size 025L

Speed 3500 RPM

Viscosity SSU		Differential Pressure – PSI						Net Inlet Pressure Required PSIA
		25	50	75	100	125	150	
GPM	33	7.7	7.1	6.7	6.3	–	–	
	150	8.4	8.2	8.0	7.8	7.7	7.6	
	300	8.6	8.5	8.3	8.2	8.1	8.0	
	650	8.8	8.6	8.6	8.5	8.4	8.3	
	1000	8.8	8.7	8.6	8.6	8.5	8.5	
	5000	8.9	8.9	8.9	8.8	8.8	8.8	
BHP	150	0.3	0.4	0.5	0.7	0.8	0.9	6.0
	300	0.3	0.5	0.6	0.7	0.9	1.0	6.0
	650	0.4	0.6	0.7	0.8	1.0	1.1	6.0
	1000	0.5	0.6	0.8	0.9	1.1	1.2	6.0
	5000	0.8	0.9	1.1	1.2	1.4	1.5	6.0

Speed 1750 RPM

Viscosity SSU		Differential Pressure – PSI						Net Inlet Pressure Required PSIA
		25	50	75	100	125	150	
GPM	33	3.2	2.6	–	–	–	–	
	150	3.9	3.7	3.5	3.2	3.1	2.9	
	300	4.1	3.9	3.8	3.7	3.6	2.6	
	650	4.2	4.1	4.0	3.9	3.9	3.8	
	1000	4.3	4.2	4.1	4.0	4.0	3.9	
	5000	4.4	4.4	4.3	4.3	4.3	4.2	
BHP	150	0.1	0.2	0.3	0.3	0.4	0.5	6.0
	300	0.1	0.2	0.3	0.3	0.4	0.5	6.0
	650	0.2	0.2	0.3	0.4	0.4	0.5	6.0
	1000	0.2	0.3	0.3	0.4	0.5	0.5	6.0
	5000	0.3	0.4	0.4	0.5	0.6	0.6	6.0

Speed 2900 RPM (50 Hz)

Viscosity SSU		Differential Pressure – PSI						Net Inlet Pressure Required PSIA
		25	50	75	100	125	150	
GPM	33	6.1	5.6	5.1	–	–	–	
	150	6.9	6.6	6.4	6.3	6.1	6.0	
	300	7.1	6.9	6.8	6.6	6.5	6.4	
	650	7.2	7.1	7.0	6.9	6.8	6.8	
	1000	7.3	7.2	7.1	7.0	7.0	6.9	
	5000	7.4	7.4	7.3	7.3	7.3	7.3	
BHP	150	0.2	0.3	0.4	0.6	0.7	0.8	6.0
	300	0.3	0.4	0.5	0.6	0.7	0.8	6.0
	650	0.3	0.5	0.6	0.7	0.8	0.9	6.0
	1000	0.4	0.5	0.6	0.7	0.8	1.0	6.0
	5000	0.6	0.6	0.9	1.0	1.1	1.2	6.0

Rotor Size 025N

Speed 3500 RPM

Viscosity SSU		Differential Pressure – PSI						Net Inlet Pressure Required PSIA
		25	50	75	100	125	150	
GPM	33	10.7	9.8	9.1	8.6	–	–	
	150	11.9	11.5	11.2	10.9	10.7	10.5	
	300	12.2	11.9	11.7	11.5	11.3	11.2	
	650	12.4	12.2	12.1	11.9	11.8	11.7	
	1000	12.5	12.3	12.2	12.1	12.0	11.9	
	5000	12.7	12.6	12.6	12.5	12.5	12.4	
BHP	150	0.3	0.4	0.6	0.8	1.2	1.2	6.0
	300	0.4	0.7	0.9	1.1	1.3	1.4	6.0
	650	0.6	0.8	1.0	1.2	1.4	1.6	6.0
	1000	0.7	0.9	1.1	1.3	1.5	1.7	6.0
	5000	1.2	1.3	1.5	1.7	1.9	2.1	9.0

Speed 1750 RPM

Viscosity SSU		Differential Pressure — PSI						Net Inlet Pressure Required PSIA
		25	50	75	100	125	150	
GPM	33	4.3	3.4	–	–	–	–	
	150	5.5	5.1	4.8	4.5	4.2	4.1	
	300	5.7	5.5	5.2	5.1	4.9	4.8	
	650	6.0	5.8	5.6	5.5	5.4	5.3	
	1000	6.1	5.9	5.8	5.7	5.6	5.5	
	5000	6.3	6.2	6.1	6.1	6.1	6.0	
BHP	150	0.1	0.2	0.3	0.5	0.6	0.6	6.0
	300	0.2	0.3	0.4	0.5	0.6	0.7	6.0
	650	0.3	0.3	0.4	0.5	0.6	0.7	6.0
	1000	0.3	0.4	0.5	0.6	0.7	0.7	6.0
	5000	0.4	0.5	0.6	0.7	0.8	0.9	6.0

Speed 2900 RPM (50 Hz)

Viscosity SSU		Differential Pressure – PSI						Net Inlet Pressure Required PSIA
		25	50	75	100	125	150	
GPM	33	8.5	7.6	6.9	6.4	–	–	
	150	9.7	9.3	9.0	8.7	8.5	8.3	
	300	10.0	9.7	9.5	9.3	9.1	9.0	
	650	10.2	10.0	9.8	9.7	9.6	9.5	
	1000	10.3	10.1	10.0	9.9	9.8	9.7	
	5000	10.5	10.4	10.4	10.3	10.3	10.2	
BHP	150	0.3	0.5	0.6	0.8	0.9	1.1	6.0
	300	0.4	0.5	0.7	0.9	1.1	1.2	6.0
	650	0.5	0.6	0.8	1.0	1.1	1.3	6.0
	1000	0.6	0.7	0.9	1.0	1.2	1.4	6.0
	5000	0.9	1.0	1.2	1.4	1.5	1.7	6.0

Rotor Size 032N

Speed 3500 RPM

Viscosity SSU		Differential Pressure – PSI						
		25	50	75	100	125	150	Net Inlet Pressure Required PSIA
GPM	33	23.4	21.9	20.8	19.9	–	–	
	150	25.3	24.7	24.2	23.7	23.3	23.0	
	300	25.8	25.3	25.0	24.7	24.4	24.2	
	650	26.2	25.8	25.6	25.4	25.2	25.1	
	1000	26.3	26.0	25.8	25.7	25.5	25.4	
	5000	26.6	26.5	26.4	26.3	26.3	26.2	
BHP	150	0.8	1.2	1.6	2.0	2.4	2.8	6.0
	300	1.0	1.4	1.8	2.2	2.6	3.0	6.0
	650	1.3	1.7	2.1	2.5	2.9	3.3	6.0
	1000	1.5	1.9	2.3	2.7	3.1	3.4	6.0
	5000	2.4	2.8	3.2	3.6	4.0	4.3	11.9

Speed 1750 RPM

Viscosity SSU		Differential Pressure – PSI						
		25	50	75	100	125	150	Net Inlet Pressure Required PSIA
GPM	33	9.9	8.5	7.4	–	–	–	
	150	11.9	11.2	10.7	10.3	9.9	9.6	
	300	12.3	11.9	11.5	11.2	11.0	10.7	
	650	12.7	12.4	12.1	11.9	11.8	11.6	
	1000	12.8	12.6	12.4	12.2	12.1	12.0	
	5000	13.2	13.1	13.0	12.9	12.8	12.8	
BHP	150	0.4	0.5	0.7	0.9	1.2	1.3	6.0
	300	0.4	0.6	0.8	1.0	1.2	1.4	6.0
	650	0.5	0.7	0.9	1.1	1.3	1.5	6.0
	1000	0.6	0.8	1.0	1.2	1.4	1.6	6.0
	5000	0.9	1.1	1.3	1.5	1.7	1.9	6.0

Speed 2900 RPM (50 Hz)

Viscosity SSU		Differential Pressure – PSI						
		25	50	75	100	125	150	Net Inlet Pressure Required PSIA
GPM	33	18.8	17.3	16.2	15.2	–	–	
	150	20.7	20.0	19.5	19.1	18.7	18.4	
	300	21.2	20.7	20.4	20.0	19.8	19.6	
	650	21.5	21.2	21.0	20.8	20.6	20.4	
	1000	21.7	21.4	21.3	20.9	20.9	20.8	
	5000	22.0	21.9	21.8	21.8	21.7	21.6	
BHP	150	0.7	1.0	1.3	1.6	2.0	2.3	6.0
	300	0.8	1.1	1.5	1.8	2.1	2.4	6.0
	650	1.0	1.3	1.7	2.0	2.3	2.7	6.0
	1000	1.2	1.5	1.8	2.5	2.5	2.8	6.0
	5000	1.9	2.2	2.5	2.9	3.2	3.5	9.0

Rotor Size 038K

Speed 3500 RPM

Viscosity SSU		Differential Pressure – PSI						
		25	50	75	100	125	150	Net Inlet Pressure Required PSIA
GPM	33	32.2	30.8	–	–	–	–	
	150	34.2	33.6	33.1	32.6	32.2	31.9	
	300	34.7	34.3	33.9	33.6	33.3	33.1	
	650	35.1	34.8	34.5	34.3	34.1	34.0	
	1000	35.2	35.0	34.8	34.6	34.5	34.3	
	5000	35.6	35.5	35.4	35.3	35.3	35.2	
BHP	150	1.1	1.6	2.1	2.6	3.2	3.7	6.0
	300	1.4	1.9	2.4	2.9	3.5	4.0	6.0
	650	1.7	2.3	2.8	3.3	3.9	4.4	6.0
	1000	2.0	2.5	3.0	3.6	4.2	4.6	6.0
	5000	3.2	3.7	4.2	4.8	5.4	5.8	11.1

Speed 1750 RPM

Viscosity SSU		Differential Pressure – PSI						
		25	50	75	100	125	150	Net Inlet Pressure Required PSIA
GPM	33	14.3	12.9	–	–	–	–	
	150	16.3	15.7	15.1	14.7	14.3	14.0	
	300	16.8	16.3	16.0	15.7	15.4	15.1	
	650	17.2	16.8	16.6	16.4	16.2	16.0	
	1000	17.3	17.1	16.9	16.7	16.5	16.4	
	5000	17.7	17.5	17.4	17.3	17.3	17.2	
BHP	150	0.5	0.7	1.0	1.2	1.5	1.8	6.0
	300	0.6	0.8	1.1	1.4	1.6	1.9	6.0
	650	0.7	1.0	1.2	1.5	1.8	2.0	6.0
	1000	0.8	1.1	1.3	1.6	1.9	2.1	6.0
	5000	1.2	1.5	1.7	2.0	2.3	2.5	6.0

Speed 2900 RPM (50 Hz)

Viscosity SSU		Differential Pressure – PSI						
		25	50	75	100	125	150	Net Inlet Pressure Required PSIA
GPM	33	26.1	24.6	–	–	–	–	
	150	28.1	27.4	26.9	26.5	26.1	25.7	
	300	28.6	28.1	27.8	27.4	27.2	26.9	
	650	29.0	28.6	28.4	28.2	28.0	27.8	
	1000	29.1	28.8	28.6	28.5	28.3	28.2	
	5000	29.5	29.3	29.2	29.2	29.1	29.0	
BHP	150	0.9	1.3	1.8	2.2	2.6	3.1	6.0
	300	1.1	1.5	1.9	2.4	2.8	3.3	6.0
	650	1.4	1.8	2.2	2.7	3.1	3.6	6.0
	1000	1.6	2.0	2.5	2.9	3.3	3.8	6.0
	5000	2.5	2.9	3.4	3.8	4.2	4.7	9.0

1. For conditions between listed values, interpolate between those values. For conditions not listed or off tables, do not interpolate. Contact IMO.
2. Net Inlet Pressure Required is minimum pressure above vapor pressure at pump inlet to prevent cavitation. This assumes that the fluid is air and gas free.
3. For BHP values at viscosities below 150 SSU, use values listed for 150 SSU.

Performance Data

Rotor Size 038N

Speed 3500 RPM

Viscosity SSU		Differential Pressure – PSI						
		25	50	75	100	125	150	Net Inlet Pressure Required PSIA
GPM	33	40.3	38.2	36.6	35.2	–	–	
	150	43.1	42.1	41.4	40.8	40.2	39.8	
	300	43.8	43.1	42.6	42.2	41.8	41.4	
	650	44.3	43.8	43.5	43.2	42.9	42.7	
	1000	44.5	44.1	43.9	43.6	43.4	43.2	
	5000	45.0	44.8	44.7	44.6	44.5	44.4	
BHP	150	1.4	2.0	2.7	3.3	4.1	4.7	6.0
	300	1.7	2.4	3.1	3.7	4.4	5.1	6.0
	650	2.2	2.9	3.5	4.2	4.9	5.6	6.0
	1000	2.5	3.2	3.9	4.5	5.3	5.8	6.2
	5000	4.1	4.7	5.4	6.1	6.8	7.3	14.7

Speed 1750 RPM

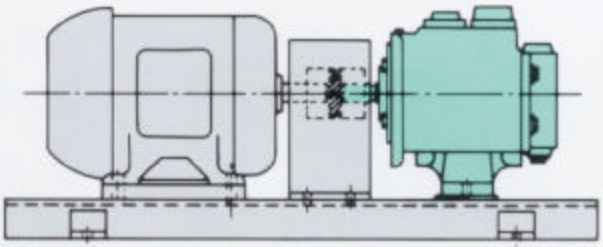
Viscosity SSU		Differential Pressure – PSI						
		25	50	75	100	125	150	Net Inlet Pressure Required PSIA
GPM	33	17.6	15.5	13.9	12.5	–	–	
	150	20.4	19.5	18.7	18.1	17.5	17.1	
	300	21.1	20.4	19.9	19.5	19.1	18.7	
	650	21.6	21.1	20.8	20.5	20.2	20.0	
	1000	21.8	21.4	21.2	20.9	20.7	20.5	
	5000	22.3	22.2	22.0	21.9	21.8	21.6	
BHP	150	0.6	0.9	1.2	1.6	1.9	2.2	6.0
	300	0.7	1.0	1.4	1.7	2.1	2.4	6.0
	650	0.9	1.2	1.6	1.9	2.2	2.6	6.0
	1000	1.0	1.3	1.7	2.0	2.4	2.6	6.0
	5000	1.5	1.9	2.2	2.5	2.9	3.2	6.0

Speed 2900 RPM (50 Hz)

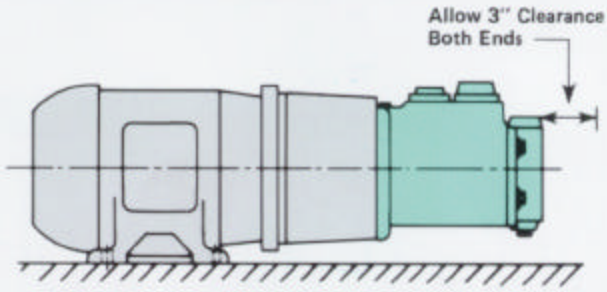
Viscosity SSU		Differential Pressure – PSI						
		25	50	75	100	125	150	Net Inlet Pressure Required PSIA
GPM	33	32.5	30.4	28.8	27.4	–	–	
	150	35.3	34.3	33.6	33.0	32.4	31.9	
	300	36.0	35.3	34.8	34.4	34.0	33.7	
	650	36.5	36.1	35.7	35.4	35.2	34.9	
	1000	36.7	36.4	36.1	35.8	35.6	35.4	
	5000	37.2	37.1	36.9	36.8	36.7	36.7	
BHP	150	1.1	1.7	2.2	2.8	3.3	3.9	6.0
	300	1.3	1.9	2.5	3.0	3.6	4.1	6.0
	650	1.7	2.3	2.8	3.4	3.9	4.5	6.0
	1000	2.0	2.5	3.1	3.7	4.2	4.8	6.0
	5000	3.1	3.7	4.2	4.8	5.4	5.9	11.9

See Notes page 5.

Pump/Motor Arrangements



Horizontal Foot Mounted ACE Pump/Motor Assembly

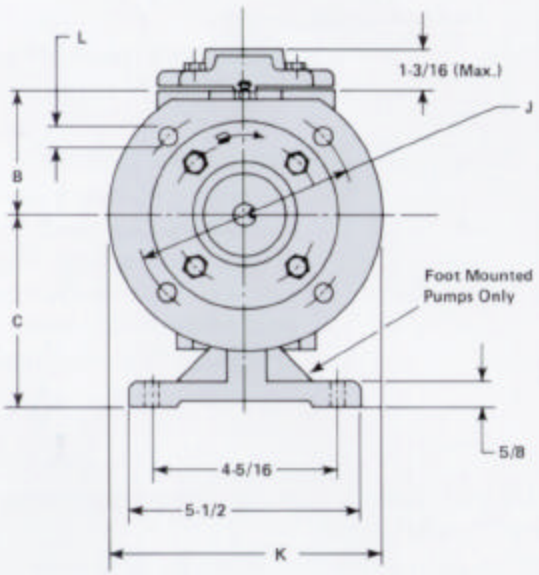


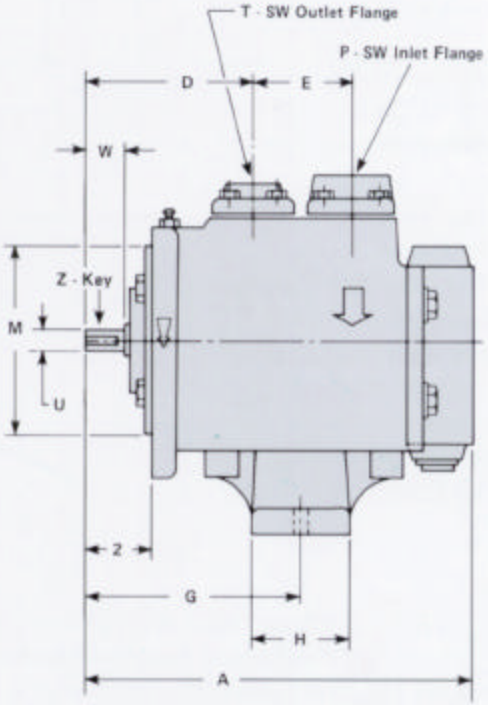
Horizontal Face Mounted ACE Pump/Motor Assembly

NOTES:

1. Pump may be mounted in a vertical or horizontal position. Suction piping to be arranged so that pump does not drain dry when not in service.
2. For variations or arrangements not shown, contact IMO.

Model ACE Dimensions





Pump Size	A	B	C	D	E	G	H	J
ACE 025	9-1/2	2-7/8	4-1/2	4-3/8	2-3/8	5-3/8	2	5-1/8
ACE 032	10-5/8	2-7/8	4-1/2	4-3/8	3	6	2-3/8	5-1/8
ACE 038	11-3/4	3-1/4	5-1/4	4-7/8	3-3/8	6-1/2	2-3/4	5-11/16

Pump Size	K	L	M (mm)	P	T	U (mm)	W	Z (mm)
ACE 025	6-5/16	3/8	110	1	1	14	1-3/16	5 x 5
ACE 032	6-5/16	3/8	110	1-1/2	1	18	1-3/16	6 x 6
ACE 038	6-7/8	7/16	120	1-1/2	1-1/2	22	1-3/8	6 x 6

WEIGHT
ACE 025 – 27lbs.
ACE 032 – 34lbs.
ACE 038 – 46lbs.

NOTES:

1. All dimensions in inches, ± 1/16 inch, unless otherwise noted.
2. Dimensions M, U and Z in MM.
   Tolerance for dimension U is ISO j6.
   Tolerance for dimension M is ISO h7.
3. Inlet and outlet SW flanges provided as standard with pump.

CERTIFIED BY		DATE
CUSTOMER		
TYPE		CUSTOMER ORDER
ROTATION	CASING	IMO ORDER

Typical ACE Nomenclature

ACE XXXX X X X X X

Series
ACE

Rotor Size
025L, 025N, 032N,
038K, or 038N

Design Series
1 = 1st Generation
(Pearlitic Cast Iron Casing)
2 = 2nd Generation
(Nodular Cast Iron Casing)

Casing Material
I = Pearlitic Cast Iron
N = Nodular Cast Iron

Relief Valve
P = Provided (Standard)
E = Excluded

Mounting
B = Bellhousing (face) Mount
F = Foot Mount

Mechanical Seal Options
V = Carbon on Ni-Resist w/Viton elastomers (Standard w/Cast Iron Casing)
T = Tungsten Carbide Face and Seat w/Viton elastomers (Standard w/Nodular Cast Iron Casing)

Examples:

ACE 025L 1 IVBP	(Model ACE with 25mm rotor size, "L" lead, cast iron casing, carbon on ni-resist mechanical seal, bellhousing mounted with relief valve)
ACE 038K2 NTFE	(Model ACE with 38mm rotor size, "K" lead, nodular cast iron casing, tungsten carbide on tungsten carbide mechanical seal, foot mounted without relief valve)

*Consult IMO for optional mechanical seal materials.

CERTIFIED
ISO 9001

Quality Management System

Imo Pump
1710 Airport Road
PO Box 5020
Monroe, NC USA
28111.5020

tel 704.289.6511
fax 704.289.9273
e-mail Imo.Pump@ColfaxCorp.com
web WWW.IMO-PUMP.COM

For additional sales and service information, contact your local IMO Sales Representative.

BROCHURE: BR000ACE REV 00 5-12-2006